

Appl. No. : 10/783,783
Filed : February 20, 2004

AMENDMENTS TO THE CLAIMS

1. (Previously presented) A method of closing a patent foramen ovale having septa including a septum primum and a septum secundum, comprising:

delivering an elongate body having a proximal end and a distal end to the patent foramen ovale, the elongate body having a tissue piercing structure at its distal end and a coil releasably engaged with the elongate body;

advancing the tissue piercing structure and the coil through the septa of the patent foramen ovale, wherein both the tissue piercing structure and the coil extend into the septum primum and the septum secundum; and

releasing the coil from the elongate body and withdrawing the tissue piercing structure from the septa of the patent foramen ovale, wherein the coil when released contracts to pinch the septum primum and the septum secundum together.

2. (Original) The method of Claim 1, wherein the elongate body includes an opening near its distal end.

3. (Original) The method of Claim 2, wherein the coil has a distal end that releasably engages the opening in the elongate body near its distal end.

4. (Original) The method of Claim 3, wherein a loading portion releasably engages a proximal end of the coil, the coil being advanced through the patent foramen ovale while the coil is engaged with both the loading portion and the opening near the distal end of the elongate body to axially elongate and radially reduce the coil.

5. (Original) The method of Claim 1, further comprising delivering a loading collar with the elongate body to the patent foramen ovale, the loading collar releasably engaging a proximal end of the coil.

6. (Original) The method of Claim 5, wherein the elongate body is rotatable relative to the loading collar.

7. (Original) The method of Claim 5, wherein the elongate body is axially slideable relative to the loading collar.

8. (Original) The method of Claim 5, wherein the elongate body is advanced relative to the loading collar prior to advancing the coil to axially elongate the coil.

9. (Original) The method of Claim 1, wherein the elongate body is delivered through an outer catheter.

10. (Original) The method of Claim 1, wherein the tissue piercing structure and the coil are delivered first through the septum secundum and then through the septum primum.

11. (Original) The method of Claim 1, wherein the coil is a first coil, and further comprising, after releasing the first coil from the elongate body and withdrawing the tissue piercing structure from the septa of the patent foramen ovale:

advancing the tissue piercing structure and a second coil releasably engaged with the elongate body through the septa of the patent foramen ovale at a location adjacent to the first coil; and

releasing the second coil from the elongate body and withdrawing the tissue piercing structure from the septa of the patent foramen ovale, wherein the second coil when released contracts to pinch the septum primum and the septum secundum together.

12. (Currently amended) A method of closing a patent foramen ovale having a septum primum and septum secundum, comprising:

releasably engaging a plurality of discrete implantable coils with a single delivery device, the single delivery device comprising a tissue piercing structure, the plurality of discrete implantable coils comprising a distal most coil releasably engaging the tissue piercing structure and one or more proximal coils positioned axially along the single delivery device;

advancing the single delivery device carrying the plurality of coils into a patient to a location proximate the patent foramen ovale;

advancing the tissue piercing structure with the distal most coil at least partially through the septa of the patent foramen ovale at a first location to secure the septum primum and septum secundum together;

retracting the tissue piercing structure proximally to engage an additional coil without removing the tissue piercing structure from the body of the patient and

advancing the tissue piercing structure with the additional coil plurality of coils at least partially through the septa of the patent foramen ovale at a second location to secure the septum primum and septum secundum together.

Appl. No. : 10/783,783
Filed : February 20, 2004

13. (Currently amended) The method of Claim 12, wherein the plurality of coils are sequentially attached to the single delivery device while the single delivery device is advanced through a single catheter.

14. (Original) The method of Claim 12, wherein the plurality of coils are each advanced first through the septum secundum and then through the septum primum.

15. (Original) The method of Claim 12, wherein the plurality of coils are each advanced first through the septum primum and then through the septum secundum.

16. (Canceled)

17. (Original) The method of Claim 12, wherein each of the coils after being advanced through the septa of the patent foramen ovale has a first end in the septum primum and a second end in the septum secundum.

18. (Original) The method of Claim 12, wherein each of the coils after being advanced through the septa of the patent foramen ovale has a first end in the left atrium and a second end in the right atrium.

19. (Previously presented) The method of Claim 12, comprising advancing at least three coils through the septa of the patent foramen ovale.

20. (Currently amended) An assembly for delivering a coil through tissue in a patient, comprising:

a coil having a proximal end and a distal end;

a loading portion adapted to releasably engage with the [[a]] proximal end of
[[a]]the coil; and

a tissue piercing structure adapted to releasably engage with the [[a]] distal end
of the coil, wherein the loading portion holds the coil relative to the tissue piercing
structure to axially elongate and radially reduce the coil.

21. (Original) The assembly of Claim 20, wherein the loading portion is integral with the tissue piecing structure.

22. (Original) The assembly of Claim 21, wherein the loading portion comprises a slot adapted to receive the proximal end of the coil.

23. (Original) The assembly of Claim 21, wherein the tissue piercing structure includes an opening adapted to releasably engage the distal end of the coil.

24. (Original) The assembly of Claim 20, wherein the loading portion comprises a loading collar, and the tissue piecing structure is moveable relative to the loading collar to axially advance and rotate the distal end of the coil relative to the proximal end of the coil to axially elongate the coil.

25. (Original) The assembly of Claim 24, wherein the tissue piercing structure is provided on an elongate body having a proximal end and a distal end, the elongate body extending through the loading collar.

26. (Canceled)

27. (Currently amended) The assembly of Claim 20 26, wherein the proximal end of the coil comprises a tang that extends into a diameter defined by the coil.

28. (Currently amended) The assembly of Claim 20 26, wherein the distal end of the coil comprises a tang that extends into a diameter defined by the coil.

29. (Original) The assembly of Claim 20, wherein the coil is sized to extend through a septum primum and a septum secundum of a patent foramen ovale.

30. (Original) The assembly of Claim 20, wherein the loading portion is adapted to releasably engage a plurality of coils.

31. (New) A method of closing a patent foramen ovale having a septum primum and septum secundum, comprising:

providing a coil having a proximal end and a coil distal end;

providing a delivery device having a proximal end and a distal end, the delivery device having a tissue piercing structure at its distal end, the tissue piercing structure releasably engaging the distal end of the coil and holding the coil in an axially stretched and radially compressed configuration;

advancing the delivery device with the coil into a patient to a location proximate the patent foramen ovale;

advancing the tissue piercing structure with the coil at least partially through the septa of the patent foramen ovale, wherein both the tissue piercing structure and the coil extend into the septum primum and the septum secundum;

Appl. No. : 10/783,783
Filed : February 20, 2004

releasing the coil from the delivery device, wherein the coil when released axially contracts and radially expands to pinch the septum primum and the septum secundum together.

32. (New) The method of Claim 31, further comprising retracting the tissue piercing structure from the septum primum and septum secundum after releasing the coil from the delivery device.

33. (New) The method of Claim 31, wherein the delivery device further comprises a loading collar provided over the tissue piercing structure that is rotatable and axially moveable relative to the tissue piercing structure, the loading collar releasably engaging the proximal end of the coil while the tissue piercing structure releasably engages the distal end of the coil to hold the coil in the axially stretched and radially compressed configuration.

34. (New) The method of Claim 33, wherein the tissue piercing structure includes an opening for engaging the distal end of the coil, and wherein rotation and axial advancement of the tissue piercing structure relative to the loading collar with the coil engaged with the loading collar and the opening causes the coil to stretch and radially compress.

35. (New) The method of Claim 34, wherein releasing the coil from the delivery device comprises retracting the tissue piercing structure to allow the distal end of the coil to exit the opening of the tissue piercing structure and rotating the loading collar to allow the proximal end of the coil to disengage from the loading collar.